

VENEZUELAN NYCTERIBIID BATFLIES (Diptera: Nycteribiidae)

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ABSTRACT

Eleven species of Nycteribiidae, all belonging to the genus *Basilina*, are reported from Venezuela. Of these, two (*tuttlei* and *typhlops*) are described as new and four (*anomala*, *dubia*, *juquiensis*, and *tiptoni*) are recorded for the first time. *B. anomala* is the first species with three tergal plates to be found in South Ameri-

ca. Synonymies, previous localities, and host records are given for all species, as well as new records and comments. Geographical distribution and host-parasite associations are discussed. Field parties of the Smithsonian Venezuelan Project obtained the material on which this paper is based.

INTRODUCTION

Guimarães and D'Andretta (1956) recorded only four species of nycteribiids from Venezuela, all belonging to the genus *Basilina*: *B. myotis* Curran, 1955; *B. wenzeli* Guimarães and D'Andretta, 1956; *B. constricta* Guimarães and D'Andretta, 1956; and *B. bequaerti* Guimarães and D'Andretta, 1956.

B. myotis, now considered to be a synonym of *Basilina ferrisi* Schuurmans-Stekhoven, 1931 (see Peterson, 1971), had already been recorded, under the name *B. bellardii* (Rondani, 1878), from Aragua by Hase (1931); from Anzoategui by Schuurmans-Stekhoven (1931); from Miranda (as *B. myotis*), from Bolívar; and Amazonas by Bequaert (1942). Guimarães and D'Andretta (1956) found it in Aragua and Zulia. Other species found by Guimarães and D'Andretta (1956) were *B. bequaerti*, from the Rio Orinoco (once); *B. wenzeli*, from Aragua (three times); and *B. constricta*, from Zulia (once). In 1963 Machado-Allison described a fifth species, *B.*

ortizi, from Bolívar. Teams of the Smithsonian Venezuelan Project collected *B. ferrisi*, *B. wenzeli*, and *B. ortizi*, plus *B. anomala* Guimarães and D'Andretta, *B. dubia* Guimarães and D'Andretta, *B. juquiensis* Guimarães, and *B. tiptoni* Guimarães, and two new species described herein. They did not find *B. bequaerti* or *B. constricta*.

This paper is based on collections made by personnel of the Smithsonian Venezuelan Project (SVP), which was directed by Dr. Charles O. Handley, Jr., U. S. National Museum of Natural History and Dr. Vernon J. Tipton, Brigham Young University.

The specimens were sent to me by Drs. C. Machado-Allison, Vernon J. Tipton, and Rupert L. Wenzel, to whom I am very grateful. Thanks are due Dr. Charles O. Handley, Jr., for the names of hosts and for the lists of vertebrates collected in Venezuela by personnel of the Smithsonian Venezuelan Project.

BASILINA SPECIES IN THE SMITHSONIAN VENEZUELAN COLLECTIONS

Basilina anomala Guimarães and D'Andretta

Basilina anomala Guimarães and D'Andretta, 1956:67, Fig. 83, 95a, 100.—Maa, 1965:380.—Theodor, 1967:258.

PREVIOUS RECORDS AND HOSTS

Mexico: Chiapas, Huehuetan, ex *Rhogeëssa*

tumida. Guatemala: Solalá, Moca, ex *Rhogeëssa tumida*.

VENEZUELAN RECORDS

One female and a male ex *Rhogeëssa tumida* (SVP 5060). Falcon, 19 km NW Urama, 27-X-1965.

REMARKS

This represents the first collection of a

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species with three apparent tergites in South America. The southernmost locality of this species was Solalál, Guatemala (however, some time ago I identified a female belonging to the Field Museum in Chicago, ex *Myotis nigricans*, from Matagalpa, Nicaragua). Tergite III of this species is actually represented by a fold of the connexivum, anterior to the anal segment, and fringed by some setae of various lengths. With the exception of the Nicaraguan specimen (ex *Myotis nigricans*), the species has been recorded only from *Rhogeessa tumida*.

Basilia wenzeli Guimarães and D'Andretta

Basilia wenzeli Guimarães and D'Andretta, 1956:42, Fig. 25-33, 57-80.—Maa, 1965:381.—Guimarães, 1966:396.—1968:101.3.—Theodor, 1967:270, Fig. 419, 467, 468.

PREVIOUS RECORDS AND HOSTS

Venezuela: Aragua, Rancho Grande, ex *Eptesicus fuscus* and *Lonchorhina aurita*. Colombia: Cundinamarca, Bogotá (Boquerón, San Francisco, 3000 m elev.), ex *Histiopus* sp. (= *H. montanus*). Panama: Bocas del Toro, Sibube; Los Santos Province; San Blas, Armila, all from *Eptesicus furinalis gaumeri*; Los Santos, Cerro Hoya, ex *Artibeus j. jamaicensis*.

VENEZUELAN RECORDS

Nineteen females and 10 males ex *Eptesicus montanus* (SVP 9, 40, 45, 46, 47, 49, 51, 55, 167, 193, 213, 423, 427, 431, 436, 438, 439, 488), D. F., 4 km NNW Caracas, 1400-1581 m elev. 21-VII to 2-VIII-1965.

REMARKS

The female of *B. wenzeli* is one of the most characteristic of South American species of the genus *Basilia* because of the length of the terminal segment and because the anal segment is located far forward. This species belongs to the group in which the posterior margin of tergal plate II of the female shows two long processes and the median elevation of the mesonotum is very conspicuous.

Basilia tiptoni Guimarães

Basilia tiptoni Guimarães, 1966:396, Fig. 36.—1968:101.3.

PREVIOUS RECORDS AND HOSTS

Panamá: Bocas del Toro, 22 miles south of Changuinola, ex *Lonchorhina aurita* or *Tonatia minuta* and ex "like *Tonatia*"; Bocas del Toro, Sibube, ex *Mimon crenulatum keenani*.

VENEZUELAN RECORDS

Twenty-eight females and 16 males ex *Mimon crenulatum* (SVP 1672, 1746, 1781, 1794, 1796, 1815,

1818, 1819, 1964, 1965, 1966, 1967, 1968, 1981, 1984, 1986, 5015, 5065, 5067, 5297), Falcon, 19 km NW Urama (at road junction known as "Km 40"), 5-25 m elev., 18-X to 16-XI-1965; 1 female and 1 male ex *Mimon crenulatum* (SVP 2933), Trujillo, 22 km N Valera near Aqua Viva, 164 m elev., 18-IX-1965; 1 female ex *Mimon crenulatum* (SVP 5654), Apure, 46 km NE Puerto Paez near Hato Cariben, Río Cinaruco, 76 m elev., 14-XII-1965.

REMARKS

According to Theodor and Peterson (1964), *B. tiptoni* is closely related to *B. mimoni*. Doubtless the two species are associated with the same species of bat, *Mimon crenulatum*, as their normal host. However, *B. tiptoni* has also been found on *Lonchorhina* sp. and *Tonatia* sp. *B. mimoni* has heretofore been known only from Loreto, Peru, but through the kindness of Dr. R. Wenzel I have had the opportunity of examining 2 males and 1 female from Belém, Pará, Brazil, also collected on *Mimon crenulatum*. The specimens of *tiptoni* here studied (17 males and 30 females) were collected on 22 specimens of *Mimon crenulatum* from western Venezuela. Besides the differences noticed by Theodor and Peterson (it is curious that *mimoni* was described in 1964 and *tiptoni* in 1966), the female of *tiptoni* has a group of setae on either side of the base of the anal segment and laterally a row of setae of median length. The number of long setae on each process of tergal plate II of *B. tiptoni* varies from 2-4; in *B. mimoni* there are only 2. The specimens from Venezuela also have only 2 setae.

Basilia bequaerti Guimarães and D'Andretta

Basilia bequaerti Guimarães and D'Andretta, 1956:37, Fig. 18-24, 56, 77.—Maa, 1965:381.—1967:370.—1965:381.—Guimarães, 1968:101.3.—Peterson, 1971:5.

PREVIOUS RECORDS AND HOSTS

Paraguay: Sapucay, ex *Histiopus dorianus* (= *Eptesicus dorianus*). Colombia: Espinal, ex *Micronycteris megalotis*. Venezuela: Río Orinoco, unidentified host.

REMARKS

No positively identifiable specimens of *bequaerti* were found among the collections of the Smithsonian Venezuelan Project. The species is very close to *Basilia ortizi* and will be discussed under the latter.

Basilia ortizi Machado-Allison

Basilia ortizi Machado-Allison, 1963, Fig. 1-6.—1967:370.—Maa, 1965:381.—1967:370.—Guimarães, 1968:101.3.—Peterson, 1971:5.

PREVIOUS RECORDS AND HOSTS

Venezuela: Bolivar, Serrania de Nurie, ex *Eptesicus melanopterus* (= *E. brasiliensis melanopterus*). Costa Rica: Puntarenas, Boca de Barranca, ex *Eptesicus gaumeri* (= *E. furinalis gaumeri*).

VENEZUELAN RECORDS

One female ex *Artibeus harti* (SVP 41), D. F., 4 km NNW Caracas, 1465 m elev., 22-VII-1965; 4 females and 1 male ex *Eptesicus brasiliensis* (SVP 6632), Amazonas, 84 km SSE Esmeralda, Boca Mavaca, Río Orinoco, 185 m elev., 13-II-1966; 2 females ex *Eptesicus furinalis* (SVP 12617), Bolivar, 146 km S and 7 km E Ciudad Bolivar, Hato San Jose, 298 m elev., 6-IV-1967; 1 female ex *Eptesicus furinalis* (SVP 15057), Monagas, 55 km SE Maturin, Hato Santa Barbara, 36 m elev., 8-VIII-1966; 1 female ex *Eptesicus furinalis* (SVP 18213), Amazonas, Tamatama, Río Orinoco, 135 m elev., 26-IV-1967; 4 females and 1 male ex *Eptesicus brasiliensis* (SVP 18324, 18345, 18347), same locality, 28-IV-1967; 2 females ex same host (SVP 18348, 18350), same locality, 28-IV-1967; 1 male ex *Myotis riparius* (SVP 19562), Amazonas, Casiquiare Canal, Capibara, 130 m elev., 8-VI-1967; 1 female ex *Eptesicus brasiliensis* (SVP 26833), Amazonas, above Maracay, W side Río Manapiare, 155 m elev., 17-VII-1967; 5 females ex *Eptesicus brasiliensis* (SVP 27951), Amazonas, W side Río Manapiare, near San Juan, 155 m elev., 20-VII-1967.

REMARKS

Without doubt, *Basilis ortizi* is very close to, if not the same as, *Basilis bequaerti*. The type materials of *B. ortizi*, which I have seen through the kindness of Dr. Machado-Allison, are mounted on a slide, and the pressure of the cover slip has so distorted the specimens that it is very difficult to study them under the microscope. Examining the type specimens under the entomological scope, and so with relatively small magnification, it seems that the only differences are in the pustulate setae of the lateral connexivum—less numerous and less uniform in length in *B. ortizi*—and in the shape of the posterior elevation of the mesonotum. Other characters, such as shape and number of setae of the posterior process of tergal plate II and shape of the anal segment, are within the limits of variability of *B. bequaerti*. All Venezuelan specimens I have examined have 2 long setae on the posterior lobes of tergal plate II, as does *Basilis mimoni* (sometimes one of those setae is of median length). However, Paragnayan and Peruvian specimens have 2-4 such setae.

Basilis juquiensis Guimarães

Basilis juquiensis Guimarães, 1946:73, Fig. 89-93.— Guimarães and D'Andretta, 1956:112, Fig. 180, 186, 187.— Maa, 1965:380 (as sub-

genus *Pseudelytromyia*).— Machado-Allison, 1967:370.— Guimarães, 1968:101.3.

Basilis juquiensis juquiensis, Theodor, 1967:279, Fig. 477, 478.

PREVIOUS RECORDS AND HOSTS

Brazil: São Paulo, Juquiá, ex *Myotis n. nigricans*.

VENEZUELAN RECORDS

Two females ex *Myotis riparius* (SVP 40267), Apure, 3 km NE Nula, La Chiricoa, 30-I-1968; 1 female ex same host (SVP 40454), same locality, 31-I-1968.

REMARKS

This species is a true puzzle. The only difference between *B. juquiensis* and *B. anceps* is the length of the pustulate setae of the lateral connexivum of the abdomen (shorter in *anceps* behind the IV spiracle). When Guimarães and D'Andretta (1956) described *B. anceps*, they suggested it could be no more than a subspecies of *juquiensis*. Theodor (1967) so considered it. The Venezuelan specimens are morphologically similar to *juquiensis*, and I have no alternative than to identify them as such. However, the geographical distribution of the two species becomes rather difficult to understand. *B. anceps* has been recorded from Colombia (Caquetá), Peru (Huanuco), and Panamá (Los Santos and San Blas) on *Myotis nigricans*. *B. juquiensis* is known only from southern São Paulo, Brazil, also on *Myotis nigricans*, and now from Apure, southwestern Venezuela, on the same host species and on *Myotis riparius*.

Basilis dubia Guimarães and D'Andretta

Basilis dubia Guimarães and D'Andretta, 1956: 102, Fig. 150, 154, 160, 167, 168, 177.— Maa, 1965:380 (as subgenus *Pseudelytromyia*).— Machado-Allison, 1967:370.— Theodor, 1967: 276; Fig. 423.— Guimarães, 1968:101.2.

PREVIOUS RECORDS AND HOSTS

Brazil: Mato Grosso, Chavantina, ex *Myotis n. nigricans*; Amazonas, Manaus, ex *Myotis n. nigricans*. Peru: Cuzco, Marcapata Hda. Cadená, ex *Myotis albescens*.

VENEZUELAN RECORDS

One female ex *Myotis albescens* (SVP 6456), Apure, 38 km NNW Puerto Paez, Río Cinaruco, 76 m elev., 25-I-1966; 1 male, same data (SVP 6459); 1 female ex *Myotis albescens* (host not cataloged), Amazonas 84 km SSE Esmeralda, SW Río Mavaca, Río Orinoco, 138 m elev., 3-III-1967; 1 female and 2 males ex *Myotis albescens* (SVP 17444), Amazonas, 108 km SSE Esmeralda, W side of Río Mavaca, 140 m elev., 3-IV-1967; 1 female ex *Saccopteryx bilineata* (SVP 34393), Apure, 3 km N Nula, Nulita, 24 m elev., 17-

I-1968; 3 females and 2 males ex *Myotis albescens* (SVP 34395, 34397), same locality and date.

REMARKS

Basilisa dubia is very close to *Basilisa carteri*; in the female the chief differences are a rather cordiform tergal plate I, a small number of pustulate setae on the lateral connexivum, and a larger number of setae on the anal segment. In the specimens under consideration, tergal plate I is not so cordiform as in the specimens previously known, and one specimen (from Apure, SVP 6456) has no pustulate setae on the lateral connexivum. Even so, I prefer, at least provisionally, to consider all specimens as *B. dubia*.

Basilisa constricta Guimarães and D'Andretta

Basilisa constricta Guimarães and D'Andretta, 1956:80, Fig. 82, 112-117, 123, 130, 131, 148.— Maa, 1965:380 (as subgenus *Pseudelytromyia*.— Machado-Alison, 1967:370.— Theodor, 1967:273, Fig. 426, 438, 472.— Guimarães, 1968:101.2.

PREVIOUS RECORDS AND HOSTS

Ecuador: Gualaquiza, ex *Myotis nigricans*; Oriente, Macas, ex *Myotis albescens* and ex *Tonatia amblyotis* (= *T. silvicola*). Peru: Huanuco, ex *Myotis n. nigricans* and ex *Uroderma bilobatum*.— Tingo Maria, Rio Huallaga, ex *Myotis n. nigricans*. Colombia: Catival, ex *Eptesicus brasiliensis*. Venezuela: Zulia, Lagunillas, ex *Macrophyllum macrophyllum*; Mérida, unidentified host.

REMARKS

This species is not represented in this collection. Guimarães and D'Andretta (1956) recorded only two females from Venezuela, one from Zulia, Lagunillas, ex *Macrophyllum macrophyllum* and one from Mérida, from an unidentified host. This species has the characteristic lateral constriction in the abdomen of the female. It belongs to group III of Guimarães and D'Andretta (1956) and to the *B. speiseri* group of Theodor (1967).

Basilisa tuttlei, new species

(Fig. 1)

This species belongs to the *speiseri* group; that is, the posterior margin of tergal plate II is straight or arcuate and the sixth sternite is longitudinally divided on the midline. It is a very characteristic species, identifiable by numerous setae on either side of the anal seg-

ment and between this segment and tergal plate II seven or eight transverse rows of setae with a bare space in the middle and by the presence of four transverse rows of setae on the anterior margin of the distal half of the tibiae.

DESCRIPTION

FEMALE: Length 2.26 mm (from the anterior margin of the vertex to the posterior end of the abdomen).

Head. Vertex with two pairs of setae between eyes and anterior margin; pair of shorter setae between eyes. Anterior margin of each gena with 6 or 7 setae scattered on either side of postgena. Each palpus with two pairs of setae near lateral margins; 5 others at apex, 1 of which is much longer than others. Eyes typically two-faceted and pigmented. **Thorax.** Wider than long (1.20 x 0.78 mm). Anterior margin only slightly curved. Thoracic ctenidium with 20-22 spines. Mesonotum raised posteriorly but without median digitiform process; notopleural suture with 9 setae. Tibiae with four transverse rows of setae on distal half of ventral edge. **Abdomen.** First tergite (first tergal plate or first visible tergite) funnel shaped, wider than long;

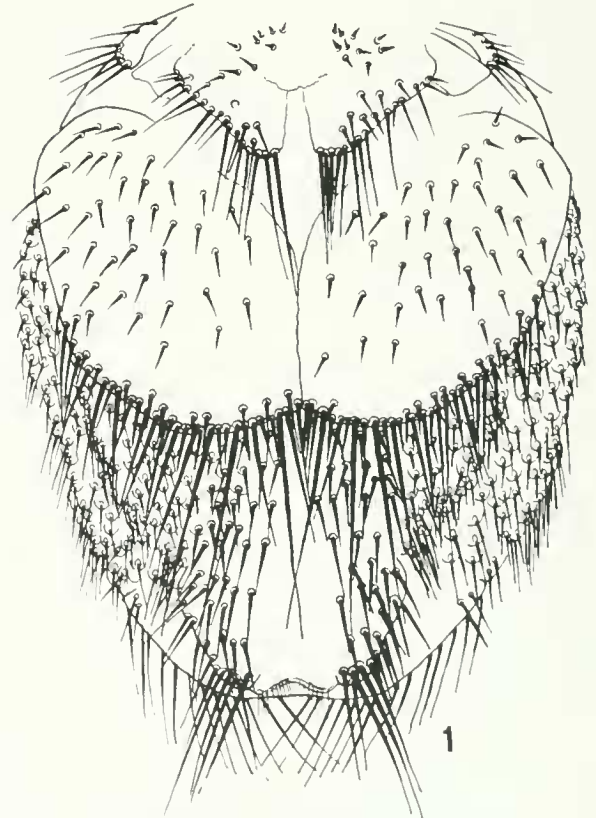


Fig. 1 *Basilisa tuttlei*, new species, abdomen of female (dorsal)

its margins with several setae of median length and several shorter medial setae. Setae of posterior margin distributed asymmetrically, more closely set on one side of tergite; posterior margin interrupted at middle to form a rather large bare space between two groups of setae; few discal short setae scattered irregularly. Tergal plate II with lateral and posterior margins arcuate, at least partially fringed by setae of medium to long length, irregularly interspersed with short, strong ones; posterior margin shows clear notch at level of median suture; discal setae uniformly distributed, except along midline and on back where they lack uniform distribution. Median suture at least partially evident. Anal segment with lateral margins slightly convergent posterad; on its posterolateral angles or near them 3 or 4 long setae and 1 or 2 median length setae on either side. On either side of anal segment and between this segment and tergal plate II, 7 or 8 transverse rows of setae; midline from tergal plate II to posterior margin of anal segment bare. Lateral connexivum with pustulate setae of varied length. Sternite I + II 0.570 mm long (including spines of ctenidium); ctenidium of posterior margin of sternite with about 74 to 76 pointed spines; sternites III and IV delimited, each one by row of setae longer than discal ones and still longer on sides; disc of sternite III with 3 longer setae on either side of midline. Sternites V and VI represented by two plates longitudinally separated on midline; each plate of tergite V with row of setae on posterior margin and another, of 5 or 6 shorter setae, anterad; each plate of sternite VI with 3 rows of setae; setae located near midline longer and stronger than others. Terminal segment with several setae of medium length forming irregular rows; setae of posterior margin stronger and longer than discal ones. Adanal plates roughly quadrangular with 3 and 4 setae on distal end. Anal sclerite small, with 2 setae irregularly disposed, linked to genital plate by clearly sclerotized strip. Genital plate with 3 setae. Tegument sculptured between adanal plates and genital plate, with numerous very small spine-like structures, more conspicuous near the genital plate.

Type Data: Male unknown. Female holotype ex *Myotis nigricans* (SVP 16216), Amazonas, Rio Cunucunuma, Belén (Mouth of Caño Culebra) 150 m elev., 2-II-1967, M. D. Tuttle and F. L. Harder collectors, deposited in the collection of the U.S. National Museum, Washington, D.C.

This species is named in honor of M. D.

Tuttle, who collected many of the nycteribiids studied in this paper.

Basilia typhlops, new species

(Fig. 2)

With *B. tuttlei*, new species, this species belongs in the *speiseri* group of species which is characterized by two tergal plates, tergal plate II with posterior margin straight or arcuate, the sixth (considering the first visible sternite as I + II) sternite longitudinally divided. Among the species of this group, *B. typhlops* closely resembles *B. dunnii*, from which it differs by several characters: tergite I is shorter (in Fig. 2 it appears still much foreshortened, owing to

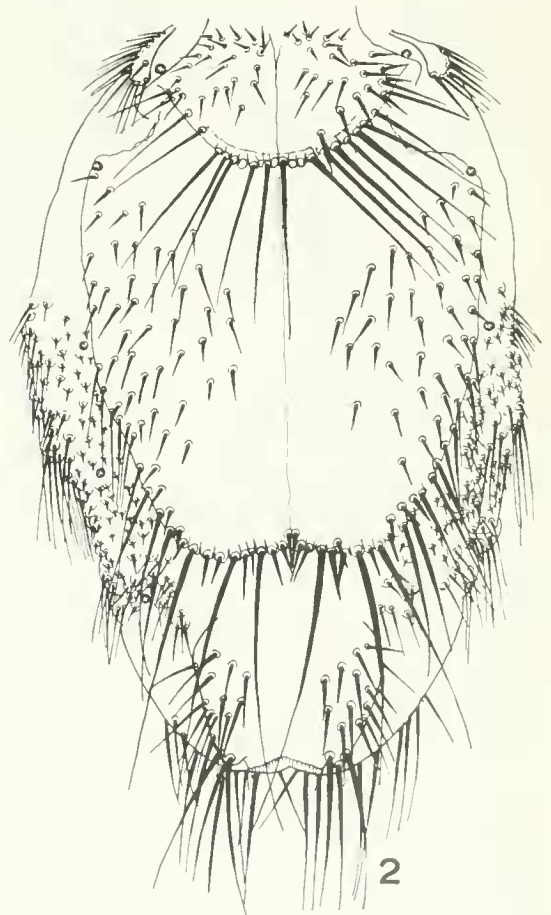


Fig. 2 *Basilia typhlops*, new species, abdomen of female (dorsal)

its curvature) and shows fewer discal setae; tergite II is narrower, its posterior margin straighter, and its discal setae have a different distribution (see below). The anal segment, in spite of having a rather similar shape, is much more pilose, and among the pustulate setae of

the lateral connexivum some are very long contrasting with the length of the other setae, while they are of uniform length in *B. dunni*. Sternite III in *B. dunni* is perfectly outlined by a row of setae, but in *B. typhlops* there is no row of setae separating sternites III and IV.

DESCRIPTION

FEMALE: Length 2.40 mm (from anterior margin of vertex to posterior extremity of abdomen). *Head.* Anterior margin of vertex with two pairs of setae; another pair further back at level of eyes. Anterior margin of each gena with 6 or 7 setae, posterior one largest; 6 or 7 scattered short setae on either side of postgena. Each palpus with 7 or 8 setae near sides and apical one much longer than others. Eyes absent. *Thorax.* Wider than long (1.07 x 0.75 mm). Thoracic ctenidium with 19-20 spines. Mesonotum slightly raised posteriorly but without median digitiform process; notopleural suture with 9 setae. Tibia normal, with three rows of setae on distal half of ventral edge. *Abdomen.* First tergite (first tergal plate, tergal plate I, or first visible tergite) half as long as tergal plate II (due to curvature of abdomen this plate appears foreshortened in Fig. 2); its margins rounded, with parallel strip, fringed by 20-26 setae that become shorter anteriorly; discal setae irregularly scattered, midline and posterior part of tergite bare; median suture rather evident. Tergal plate II with lateral margins slightly rounded, posterior margin nearly straight; posterior half of lateral margin fringed with setae of median length, increasing posteriorly; posterior margin also fringed with 6 or 7 long, strong setae interspersed with 1 or 2 much shorter but also strong setae (spinelike setae); discal setae more numerous on sides of tergite, fewer toward midline, outlining a rough triangle, pointing toward midline but not reaching suture; the latter rather evident. Anal segment with lateral margins converging backward, with several setae on either side; on lateroposterior angle 3 or 4 setae, longer and stronger than discal ones. Lateral connexivum covered with pustulate setae of varied length but chiefly small; longer setae of region contrast sharply with smaller ones. Sternite I + II 0.570 mm long (including spines of ctenidium); ctenidium of posterior margin with 59 to 64 pointed spines; base of sternite bare, discal setae not very numerous and increase moderately in size posteriorly. Sternites III and IV without clear delimitation since there is only one regular row among numerous setae between sternite I + II and sternite V; other setae of region increase in length toward posterior row. Sternites V and VI better

sclerotized and divided on midline, each one thus with two lateral sclerites; each plate of sternite V with two rows of setae: posterior one, near the margin, with at least 10 setae; anterior one with 3 or 4 setae irregularly distributed. Each sclerite of sternite VI with three rows of setae, two anterior ones with fewer and irregularly distributed setae; posterior row forms fringe on posterior margin of sternite. On lateral sides of tergites V and VI setae appear to be arranged in indistinct rows. Terminal sternite not as long as wide, with several discal and lateral setae on posterior two-thirds. Adanal plate triangular, with 3 setae on distal end. Anal sclerite small, with 2 setae, apparently linked to genital plate by a strip slightly better sclerotized than tegument. Genital plate with 6 setae. Between adanal plates and genital plate tegument is sculptured with numerous very small spinelike structures.

Type Data: Male unknown. Female holotype ex *Myotis oxyotus* (SVP 8191), Bolivar, 85 km SSE El Dorado at km 125, 826 m elev., 16-V-1966, M. D. Tuttle and A. L. Tuttle collectors, deposited in the collection of the U.S. National Museum, Washington, D.C. One paratype female ex *Myotis oxyotus* (SVP 42998), Bolivar, 43.2 km NE Icabarú, El Mundo Nuevo de Surukun; 851 m elev., 3-V-1968, A. L. Tuttle collector.

REMARKS

This is the first eyeless species of *Basilina* from the New World. Although one of the specimens shows, under greater enlargement (8 x 25 x 1.6), the tegument a little lighter in the ocular region, it is without any doubt completely blind. The absence of eyes is, according to Theodor (1967), the only character that separates the subgenus *Tripselia* from *Basilina* s. str. Three species of the subgenus *Tripselia* occur in continental Africa, Mauritius, and Madagascar; 6 or 7 species occur in the Oriental region (India, Ceylon, Borneo, and Sumatra) and 10 species occur in Australia and New Guinea. They form a rather homogeneous group, with tergal plate II similar to that of the *bathybothyra* group of the subgenus *Basilina* and with at least three tergal plates, a character of every species of the subgenus *Basilina* in the Old World and of 5 American species. *B. typhlops* new species belongs to the *speiseri* group and, as in the majority of the South American species, has only two tergal plates (*B. anomala*, a species with three tergal plates, is being reported for the first time from South America in this paper). The absence of eyes and the geographic dis-

tribution of the subgenus *Tripselia* may indicate an evolutionary lineage originating from the *bathybothyra* group, which belongs to the subgenus *Basilia* and accordingly has eyes. On the other hand, the absence of eyes in a South American species typically belonging to the *speiseri* group is certainly due to parallel evolution. So, it would not be justifiable, solely on the ground of eyelessness, either to place the new species in the subgenus *Tripselia* or to sink this subgenus in *Basilia* s. str. Distributed over all zoogeographic regions of the world, the genus *Basilia* has more than 80 species, is consequently very heterogeneous (chiefly the females), and needs a very careful revision. Until this is done I prefer to place *typhlops*, new species, in the group *speiseri* of the subgenus *Basilia*.

Basilia ferrisi Schuurmans-Stekhoven

Basilia speiseri Ferris, 1924:198, Pl. III (nec M. Ribeiro, 1907).—Stiles and Nolan, 1931:648 (part).—Curran, 1935:4 (part).

Basilia ferrisi Schuurmans-Stekhoven, 1931:217.—Scott, 1936:502.—1939:168.—1940:61.—Guimarães, 1940:5.—1946:16, 19.—1968:101.2—Guimarães and D'Andretta, 1956:75.—Maa, 1965:380 (as subgenus *Pseudelytromyia*).—Theodor, 1967:278.—1968:101.2.—Peterson, 1971:3.

Basilia bellardii Schuurmans-Stekhoven, 1931:207, Fig. 1-6 (nec Rondani, 1878).—Hase, 1931:220, Fig. 1-17; Scott, 1936:497 (part).—Bequaert, 1942:83.—Guimarães, 1946:62 (part).—Karaman, 1948:42, Fig 4.

Basilia myotis Curran, 1935:3, Fig. 3-5.—Scott, 1936:497.—Bequaert, 1942:84.—Del Ponte, 1944:124.—Guimarães, 1946:16, 19.—1966:398.—1968:101.3.—Guimarães and D'Andretta, 1956:76, Fig. 85, 106-111, 124, 129, 145.—Peterson, 1960:34.—Maa, 1965:380 (as subgenus *Pseudelytromyia*).—Machado-Allison, 1967:370.

Guimaraesia bellardii, Schuurmans - Stekhoven, 1931:112.

PREVIOUS RECORDS AND HOSTS

Costa Rica: Sipurío, ex *Myotis nigricans*; Alajuela, Playavelas (?), ex *Myotis* sp. Guatemala: Finca San Victor, ex *Myotis nigricans* and *Molossus* sp. (*bondae*?). Panamá: Tapia, ex *Myotis nigricans*; Darien, Camoganti, ex *Myotis nigricans*; Canal Zone, Gamboa, Fort Davis and Barro Colorado Island, ex *Myotis n. nigricans*. Colombia: Antioquia, ex *Myotis nigricans*; San-

tander, ex *Myotis nigricans*; Meta, Villavicencio, ex *Myotis nigricans*; Chocó, Andagoya, unidentified host; Bolivar, Socorré, ex *Myotis nigricans*, Cativeal, ex *Myotis nigricans*, Colosso, ex *Uroderma bilobatum*. Peru: Loreto, Pucallpa, unidentified host. Venezuela: Anzoategui, Puerto la Cruz, ex *Myotis* sp.; Bolivar, Surukun, ex *Myotis nigricans*; Amazonas, Río Casiquiare, unidentified host; Miranda, Petare, "El Encantado," unidentified host; Aragua, Ocumare de la Costa, ex *Myotis* sp.; Rancho Grande, ex *Myotis* sp.; Zulia, Lagunillas, ex *Myotis n. nigricans*, *Dasypterus* sp., (= *Lasiurus ega*), and *Molossus crassicaudatus*. Guyana: Demerara, Buxton, ex *Myotis n. nigricans*.

VENEZUELAN RECORDS

One female and 1 male ex *Myotis nigricans* (SVP 13904, 13907), Monagas, 2 km N and 2 km W Caripe, Hda. San Fernando, 1190 m elev., 4-VII-1967; one female, ex *Myotis albescens* (SVP 13934), same locality, 5-VII-1967; one female ex *Desmodus rotundus* (SVP 14276), Monagas, 2 km S and 2 km W Caripe, Hda. Tucuseto, 854 m elev., 13-VII-1967; one female and one male ex *Myotis nigricans* (SVP 31356), Amazonas, 25 km SSE Puerto Ayacucho, Paria, 114 m elev., 4-X-1967; one female and one male ex *Myotis riparis* (SVP 34405), Apure, 3 km N Nula, Nulita, 24 m elev., 17-1-1968.

REMARKS

Recently, upon comparing the syntypes of *Basilia ferrisi* (identified in 1924 by Ferris as *B. speiseri* and independently named *ferrisi* by Schuurmans-Stekhoven in 1931 and by Scott in 1936) with the type of *Basilia myotis*, Peterson (1971) confirmed the supposition of Guimarães and D'Andretta (1956:76) that the two are actually the same species.

The specimens from Amazonas and Apure are typical *ferrisi*, but those from Monagas (only females) show a longer first visible tergite (tergal plate 1) and fewer pustulate setae on the lateral connexivum. In spite of these differences, I prefer to call all present specimens *ferrisi* until better materials are available.

Specific determination is not possible for 6 male specimens (representing five collections). Two males, ex *Mimon crenulatum* (SVP 42690), Zulia, 48 km WNW Encontrados, El Rosario, 54 m elev., 1-IV-1968; 1 male ex *Myotis riparius* (SVP 7613), Bolivar, 50 km SE El Manteco, Río Supamo, 150 m elev., 7-IV-1966; 1 male ex *Myotis riparius* (SVP 40269), Apure, 3 km NE Nula, La Chiroca; 1 male, ex *Mimon crenulatum* (SVP 34596), Apure, 3 km N Nula (San Camilo), Nulita, 24 m elev., 22-I-1968; 1 male, ex *Myotis nigricans* (SVP 34835), Apure, 3 km N Nula (San Camilo), Nulita, 24 m elev., 24-I-1968.

Key to Females of Venezuelan Species of *Basilia*²

1. Two tergal plates on abdomen anterad of anal segment 2
 Three tergal plates on abdomen anterad of anal segment; third plate appears to be only a fold of segment, fringed by row of setae *anomala*
2. Tergal plate II (second visible tergite or tergite II) produced posterad into two lobes; lateral margins of same tergite at least shallowly curved inward at caudal third 3
 Tergal plate II with rounded or straight posterior margin 6
3. Posterior process of tergal plate II very narrow; terminal segment long, reaching far beyond anal segment *wenzeli*
 Not as above 4
4. Tergal plate I (first visible tergite or tergite I) moderately produced in middle and with 2-4 setae on process; several setae on base of anal segment; area of pustulate setae of lateral connexivum ending behind, on each side, in row of setae *tiptoni*
 Tergal plate I not produced in middle, fringed with several setae 5
5. Pustulate setae of lateral connexivum very short and of uniform length *bequaerti*
 Pustulate setae of lateral connexivum short but not uniform in length *ortizi*
6. Each plate forming tergal plate II more than twice as long as wide; this tergite with group of setae on anterior lateral corners and another in middle *juquiensis*
 Tergal plate II not as above 7
7. Lateral connexivum bare posteriorly or with small group of very short pustulate setae in middle of bare region *dubia*
 Lateral connexivum not as above 8
8. Each plate of tergal plate II twice as wide as long; constriction at middle of abdomen *constricta*
 Each plate of tergal plate II longer than wide, but no more than twice so; no abdominal constriction 9
9. Tibiae of all legs with four transverse rows of setae on ventral margin; seven to eight rows of a few setae each on anal segment and between it and tergal plate II *tuttlei*, new species
 Not as above 10
10. Discal setae of tergal plate II forming on each side an angle pointing toward midline of tergite; longer setae of posterior margin of tergal plate I not reaching posterior margin of tergal plate II *typhlops*, new species
 Tergal plate II with few discal setae distributed mainly on sides; longer setae of posterior margin of tergal plate I reaching to or beyond posterior margin of tergal plate II *ferrisi*

HOST RELATIONSHIPS AND DISTRIBUTION

So far I know of 95 collections, with a total of 168 specimens of Nycteribiidae from Venezuela. Of these, 133 specimens, from 77 host specimens, have been contributed by field parties of the Smithsonian Venezuelan Project. The number of collections is not large, considering the quantity of bats found among the 40,000

mammals from which 25,000 samples of ectoparasites were gathered in 48 major Venezuelan localities (Handley, 1971). In fact, nycteribiids are infrequent parasites of American bats, especially when compared with the Streblidae, and the Venezuelan collections do not disprove this observation. Even so, these data make it

²All characters used in the key are visible under the mid or low magnification of an entomological microscope; the specimens may be studied in alcohol or after clearing for a short time in 10% KOH.

possible to present some interesting information on the distribution and host-parasite relationships of the nycteribiids in Venezuela.

With the exception of the two new species described in this paper (*typhlops* and *tuttlei*), all species found so far in Venezuela were previously known either from Central or South America.

B. anomala has been found in southern Mexico, Guatemala, and Nicaragua and now in Venezuela. This is the first record of a South American species of *Basilia* whose female has the abdomen with three tergal plates. Besides *B. anomala*, four other species are known from the New World with three tergal plates: *antrozoi* (Townsend, 1893); *pizonychus* Scott, 1939; *forcipata* Ferris, 1924; and *jellisoni* Theodor and Peterson, 1964. *B. antrozoi* ranges from Oregon (Con Canyon) in the United States to Guerrero, Mexico; *B. pizonychus*, a species very close to *antrozoi*, is restricted to some islands in the Gulf of California and lives on a species of bat (*Pizonyx vivesi*) of very peculiar habits which is also restricted to the same islands; *jellisoni* is known from a single specimen collected on a *Myotis* from Montana (Missoula Co.); and *forcipata*, found chiefly on *Myotis*, ranges from British Columbia, Canada, to San Luis Potosi, Mexico. However, another species of batfly (*B. corynorhini*) with only two tergal plates also occurs in the western United States from Utah to Texas. With the exception of the specimen from Nicaragua, collected on *Myotis*, *B. anomala* has been collected only on *Rhogeessa tumida*. It is probable that this is its true host and that the batfly follows it from Mexico to northern South America.

B. bequaerti shows a great disjunction in its geographic distribution: Paraguay, Colombia, and Venezuela. Its hosts are *Histiotes* (*Eptesicus*) (Paraguay, 3 times) and *Micronycteris* (Colombia, once). The host species of the pair found in Venezuela is unknown, and no typical specimens of the species have been found among the nycteribiids here studied. *Micronycteris megalotis* and *Histiotes dorianus* (= *Eptesicus dorianus*) are at least partially sympatric.

B. constricta occurs in Venezuela, Colombia, Peru, and Ecuador and has been found on *Myotis nigricans* (three times), *Myotis albescens* (once), *Eptesicus brasiliensis* (once), *Tonatia amblyotis* (= *T. silvicola*) (once), *Uroderma bilobatum* (once), and *Macrophyllum macrophyllum* (once). All of these hosts are sympatric.

B. dubia shows an apparent disjunction, but the localities where it has been found are in the Amazon region or near its limits. All speci-

mens were found on *Myotis nigricans* (two times) or on *Myotis albescens* (six times). One specimen, however, came from *Saccopteryx bilineata*: it is the first time that a nycteribiid is recorded from a bat of the family Emballonuridae.

B. ferrisi occurs in Guatemala, Costa Rica, Panamá, Colombia, Venezuela, Guyana, and Peru. In spite of records from *Molossus bondae* (?), *Uroderma bilobatum*, *Dasypterus* sp., *Molossus crassicaudatum*, and *Desmodus rotundus*, it has been found chiefly on bats of the genus *Myotis* (*nigricans*, *albescens*, and *riparius*). It is probably the commonest species of *Basilia* in the area. Its distribution is complementary to that of *B. speiseri*, which is found in Argentina (?), Brazil, and Paraguay. The recent finding of *B. astochia* Peterson and Maa, 1970, in Colombia (certainly sympatric with *ferrisi*, but morphologically very near *speiseri*) suggests that the range of *speiseri* may reach farther northward than presently known. It is really probable, as suggested by Peterson and Maa (1970), that *myotis*, *astochia*, and *speiseri* form a very closely linked "Artenkreis."

B. juquiensis is, as said above, a true puzzle. It is a very characteristic species based on a single female found on *Myotis n. nigricans* from Juquiá in the south of the State of São Paulo, Brazil. In 1956 Guimarães and D'Andretta described *B. anceps*—which is found on *Myotis n. nigricans*—based on four females from Colombia (Caqueta) and Peru (Huamaco). They suggested that since the differences between *juquiensis* and *anceps* were so subtle, that these taxa might be considered only subspecies. This concept was adopted by Theodor (1967) in his monograph. Guimarães also recorded an extension of the range of *anceps* to include Panamá. However, *B. juquiensis* is now known from Apure on *Myotis riparius*. The geographic disjunction of *juquiensis* is large and is difficult to understand possibly because of a lack of extensive collections. *Myotis nigricans* is found in Central and South America from the south of Mexico to southern Brazil and from coast to coast.

B. ortizi has been found in Venezuela associated with *Eptesicus melanopterus* (*E. brasiliensis melanopterus*) (type-host), *Eptesicus fuscus*, *Eptesicus* sp., *Myotis riparius*, and *Artibeus harti* (?). There is only one record from outside Venezuela: Peterson (1971) found it on *Eptesicus guaneri* (= *E. furinalis guaneri*) in Costa Rica.

B. tiptoni was described from Panamá from material found on bats of doubtful identification ("*Lonchorhina* or *Tonatia*": "on a bat like *Tonatia*") and on *Mimon crenulatum keenani*.

The specimens collected in Venezuela (17 male and 29 female) came from *Mimon crenulatum* (22 host specimens). It seems that the true host of *B. tiptoni* is *Mimon crenulatum*. The other species also found on *Mimon crenulatum* (*B. mimoui*) has been found only in Amazonia (Loreto, Rio Javary, Peru, and Pará, Belém, Brazil). It is possible that *B. tiptoni* occurs in the north of South America and in Central America and that *B. mimoui* occurs southward following *Mimon crenulatum*.

The two new species here described so far occur only in Venezuela: *typhlops* on *Myotis n. nigricans* and *Myotis* sp. (*oxyotus*), and *tuttlei* on *Myotis n. nigricans*, both from Bolívar.

B. weuzeli has been collected in Venezuela, Panamá, and Colombia on *Lonchorhina aurita*, *Artibeus jamaicensis*, and *Histiotus montanus*; but its true hosts are probably bats of the genus *Eptesicus*, on which it has been collected several times.

Of the 11 species recorded from Venezuela, only 2, here described as new, are so far exclusive to the country. All others had been pre-

viously recorded from other countries in South or Central America or both.

Of the species of *Basilisa* found in Venezuela, *B. bequaerti* (Paraguay) and *juquiensis* (southern São Paulo, Brazil) reach farthest to the south, *B. ferrisi* (Guatemala) and *anomala* (Chiapas, Mexico) to the north. All species, with the exception of *B. anomala*, belong to typically South American species groups. The other species (*ortizi*, *tiptoni*, *wenzeli*, and *ferrisi*) that extend to Central America are undoubtedly of South American origin.

As to host associations, it is very clear that the genus *Basilisa* is closely linked to the bat family Vespertilionidae. However, *B. tiptoni* is beyond doubt associated with a phyllostomid bat (*Mimon crenulatum*).

On the other hand the records of *ortizi* on *Artibeus harti* (Phyllostomidae) are doubtful, and the presence of *B. ferrisi* on *Desmodus rotundus* (Desmodidae) and that of *B. dubia* on *Saccopteryx bilineata* (the first record of nycteribiid on a New World emballonurid bat) are certainly no more than accidental.

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